CENTENNIAL WASH AT WENDEN
FCD GAGE ID# 5093

STATION DESCRIPTION

LOCATION – The gage is located in La Paz County on the US 60 bridge over Centennial Wash just east of the town of Wenden, Arizona. Latitude 33° 49' 25.8" North, Longitude 113° 31' 57.6" West. Located in the SE1/4 NE1/4 NW1/4 S32 T6N R12W in the Salome 7.5-minute quadrangle.

ESTABLISHMENT – Gage was established September 16, 1998.

DRAINAGE AREA – approximately 586 mi^2

GAGE – The gage is a pressure transducer type instrument located on the left side of the 7th bridge pier from the right bank. The PT is at gage height 0.00 feet, levels of December 2, 1998, or 1,858.74 feet NAVD 88.

There is one staff gage at this location. It is located on the rightmost pier on the downstream side of the US 60 bridge. It is set to read in gage height, but actually reads about 0.1 feet low.

There is no crest gage at this location.

ZERO GAGE HEIGHT - Zero is defined as the bottom of the PT box. Elevation 1,858.64 feet NAVD 1988.

HISTORY – No previous gaging history at this location. Station installed on September 16, 1998. Rebar survey markers were installed on October 2, 2000 on both banks of the downstream side of US60 bridge. Gage was removed for construction from December 2, 2002 to July 8, 2004. Staff gage installed on the rightmost downstream pier on December 14, 2006. A new brass cap was installed on December 14, 2006.

REFERENCE MARKS –

RM-CENWEN is destroyed.

RM-CENWEN2 is a brass cap located streamward and downslope from the station tube. Elevation 5.18 feet gage height, or 1,863.82 feet NAVD 88, levels of December 14, 2006.

RM1 is an ADOT brass cap located on the west end of the downstream bridge rail near the gage standpipe. It has an elevation of 1,872.36 feet NAVD 1988 levels of October 2, 2000 or 13.72 feet gage height, levels of April 25, 2005.

RP1 is the bottom of the PT housing box. Elevation is 0.00 feet gage height.

RP2 is the top of the left front corner of the PT housing box. Elevation 1.02 feet gage height, levels of April 25, 2005.

CHANNEL AND CONTROL – The channel at the gage is natural up and downstream and has essentially a trapezoidal shape. Currently, the channel is heavily vegetated both up and downstream.

For very low discharges up to about 0.0 feet gage height, the control is probably weir flow over a small triangular hard dirt surface near the gage. It empties a scour pond between the piers at the PT. For higher flows the channel is control. However, vegetation changes are likely to strongly affect the rating at this site. Specifically, tumbleweed has grown up over most of the channel width to a height of about 5 feet gage height. How this will react to a large flow is uncertain. It is foreseeable that discharge could increase with decreasing stage as the vegetation breaks loose or bends over.

During the larger events of August 2000 and October 2000 flow downstream from the US60 bridge made its way to the immediate east and west. Observations on August 30, 2000 at the right bank had flow making a 75-degree bend past the bridge. The channel downstream of the US60 bridge is very flat and very wide. Following the October 2000 flooding, a dike was constructed to the immediate west of the bridge on the downstream side of US60.

RATING – The current rating is Rating #3. It is applied as of Water Year 2005. The need for a new rating is because the channel up and downstream of the US60 bridge has become severely choked with riparian vegetation. The rating was developed with the same model as Rating #2 using a higher n value. The roughness value has increased significantly. The resulting rating used a roughness coefficient of 0.08.

Rating #2 was applied following the August 30, 2000 event. Rating #2 was developed using cross sectional data from a December 21, 2000 survey. In the HEC-RAS program, data at the US60 bridge were updated with the new survey data. All other cross sectional data were not changed and are the same as used in Rating #1 evaluation. Furthermore, additional profiles up to 30,000 cfs were included in the new rating to accommodate the higher flows up to the low chord of the US60 bridge. It appears that 30,000 cfs is the maximum passable by the bridge.

Rating #1 was applied as of gage installation on September 16, 1998. The channel slope taken from the topographic map is 0.003. This was used in conjunction with the cross section surveyed at the bridge. A Manning's equation computation was done for this single cross section to start. This was then compared to a few simplified HECRAS models based again on the bridge cross section with some modification up and downstream for wider overbanks. Uncertainty in the roughness makes all these analyses highly uncertain. Rating No. 1 was derived from a HECRAS bridge model using the map slope of 0.003, the bridge cross section,

modified overbanks up and downstream with 100:1 side slopes, and an average channel Manning's n of 0.045. Based on Rating No. 1 the Nora flood high water elevation corresponds to about 10,000 cfs. This compares reasonably with the slope-conveyance estimate of 8,100 cfs for a reach downstream of Salome given 1) the length of reach between Wenden and the S-C reach, and 2) the large uncertainties in the computations of Rating No. 1 and the S-C estimate.

DISCHARGE MEASUREMENTS – High water measurements would be difficult given that the shoulder is not wide enough for a bridge crane.

POINT OF ZERO FLOW – The PZF is at approximately –2.5 feet gage height, levels of April 2005.

FLOODS – A flood occurred on October 22, 2000 at 24,250 cfs and 7.82 feet gage height. High water marks from the flood resulting from the remnants of Hurricane Nora were still visible on many of the bridge piers as of December 1998. These were surveyed at about 5.5 feet gage height. Based on Rating No. 1 this corresponds to about 10,000 cfs.

REGULATION – Many long earthen dams cross the wash upstream. During the Nora flood many were breached at multiple locations.

DIVERSIONS – None known. Perhaps there is diversion of flow to Sols Wash at Centennial Wash headwater area.

ACCURACY – Poor, due to heavy, variable vegetation growth.

JUSTIFICATION – Monitor upper Centennial Wash runoff for potential impacts downstream.

UPDATE - July 13, 2011
D E Gardner